

# Using Plan Quality Metrics for Maintenance of Certification

**Quantifying Improvement in Treatment Plan  
Quality Subsequent to Training within a  
Radiation Oncology Department**

# Purpose of Talk

- Discuss PQI and the PDSA Process
  - Plan
  - Do
  - Study
  - Act
- Discuss how this project affected our Practice
  - Physicians
  - Physicists
  - Dosimetrists

# Plan

- Identify an area judged to be in need of improvement
  - Physician Issues
    - Unhappy with quality of plans and process for evaluating plans
      - “If we are going to state that we are giving the best quality of care in the community, we have to do it, and we have to prove it. You haven’t been able to provide me with that level of confidence since I got here. What are you going to do about it?”
    - “I’m not comfortable utilizing IMRT for lung treatments because I’m not comfortable with the treatment planning process nor are my dosimetrists. I also have difficulty evaluating the plans. I’m not sure what I should be looking at. What are you going to do about it?”
- Identified Areas
  - Desired treatment plan objectives not being achieved
  - No set process to evaluate plans
- Devise a method to assess the degree of need

# Plan

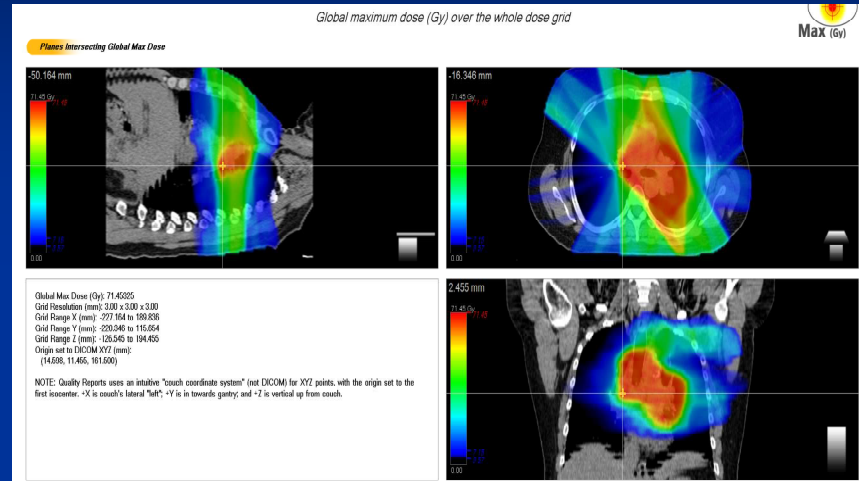
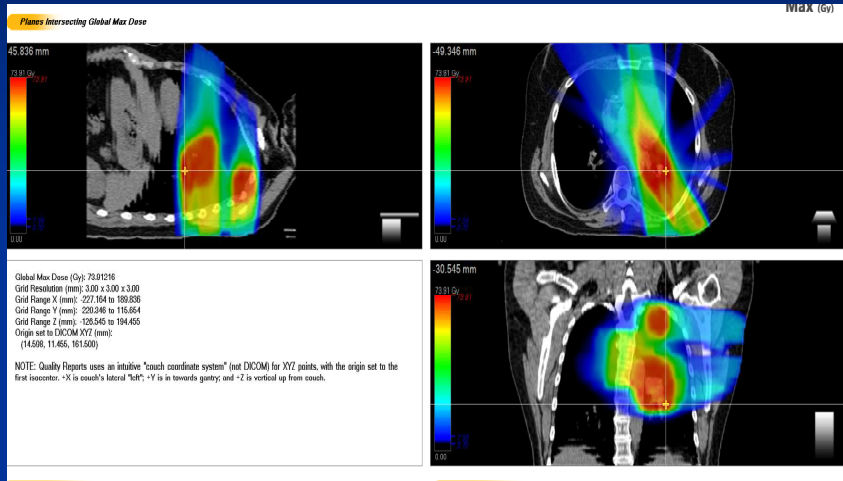
- Assess the Lung IMRT planning skill of dosimetrists
  - Hired Radiation Oncology Resources to evaluate and train dosimetrists
  - Measure quality of plans prior to training and post training
- Assess utilization of IMRT compared to other facilities across our Network
  - Collected Data across USON for utilization comparison
- Set Goal of 10% Improvement in measurable objectives
- Set goal of 10% increase in IMRT utilization for the Practice

# Do

## Set Plan in Motion and Collect Data

- Hire Radiation Oncology Resources to evaluate and train planners
- 3-Day Training Session with Radiation Oncology Resources
  - Provide training to planners, physicians and physicists
  - Provide improved methods for planning and evaluating IMRT plans using practice treatment planning system
  - Provide training using Quality Reports to evaluate and improve treatment plans
- Physician participation in USON IMRT Workshops
- Physicist and Dosimetrist participation in USON IMRT Workshops
- Dosimetrist participation in USON Pilot Program-EPIQ-Dosimetry

# Quantifying Improvement in Treatment Plan Quality Subsequent to Training Within a Radiation Oncology Department



QUALITY REPORTS [EMR]®

## Plan Quality Scoresheet: Lung 64.8

This is the Plan Quality results spreadsheet for Plan Quality Algorithm: Lung 64.8. The breakdown of results (metric-by-metric over all components) are shown in individual rows in the spreadsheet. SCORE: 59.35 (max 110.00)

Plan Quality Metric Component	Objective(s)	Result	Score	Max Score	Performance
[PTV1 64.8] V[64.8Gy] (%)	≥ 95 [ > 90]	94.9004	9.80	10.00	98.0%
[PTV1 64.8] D[0.03cc] (Gy)	≤ 71.3 [ < 71.32]	73.8689	0.00	10.00	0.0%
[PTV1 64.8] Volume of Regret [64.8Gy] (cc)	≤ 64.8 [ < 68]	83.4803	0.00	10.00	0.0%
[PTV1 64.8] Conformation Number [64.8Gy]	≥ 1 [ > 0.6]	0.7536	1.92	5.00	38.4%
[TOTAL LUNG] Mean dose (Gy)	≤ 16 [ < 20.1]	16.9236	7.75	10.00	77.5%
[TOTAL LUNG] V[20.0Gy] (%)	≤ 30 [ < 35]	28.6765	10.00	10.00	100.0%
[SC] V[50.0Gy] (cc)	≤ 0.03 [ < 0.31]	0.0000	10.00	10.00	100.0%
[HEART] V[30.0Gy] (%)	≤ 30 [ < 50]	12.7077	5.00	5.00	100.0%
[ESOPHAGUS] V[35.0Gy] (%)	≤ 40 [ < 55]	31.8670	5.00	5.00	100.0%
[ESOPHAGUS] Mean dose (Gy)	≤ 25 [ < 35]	26.1818	4.41	5.00	88.2%
Global Max Location (ROI)	PTV1 64.8 [PTV1 64.8; PTV2]	PTV1 64.8	5.00	5.00	100.0%
[PTV1 64.8] V[68.04Gy] (%)	≤ 5 [ < 25]	60.6136	0.00	20.00	0.0%
Global Max (Gy)	≤ 68.04 [ < 74.52]	73.9122	0.47	5.00	9.4%
<b>Total [13 Metrics]</b>			<b>59.35</b>	<b>110.00</b>	<b>54.0%</b>



QUALITY REPORTS [EMR]®

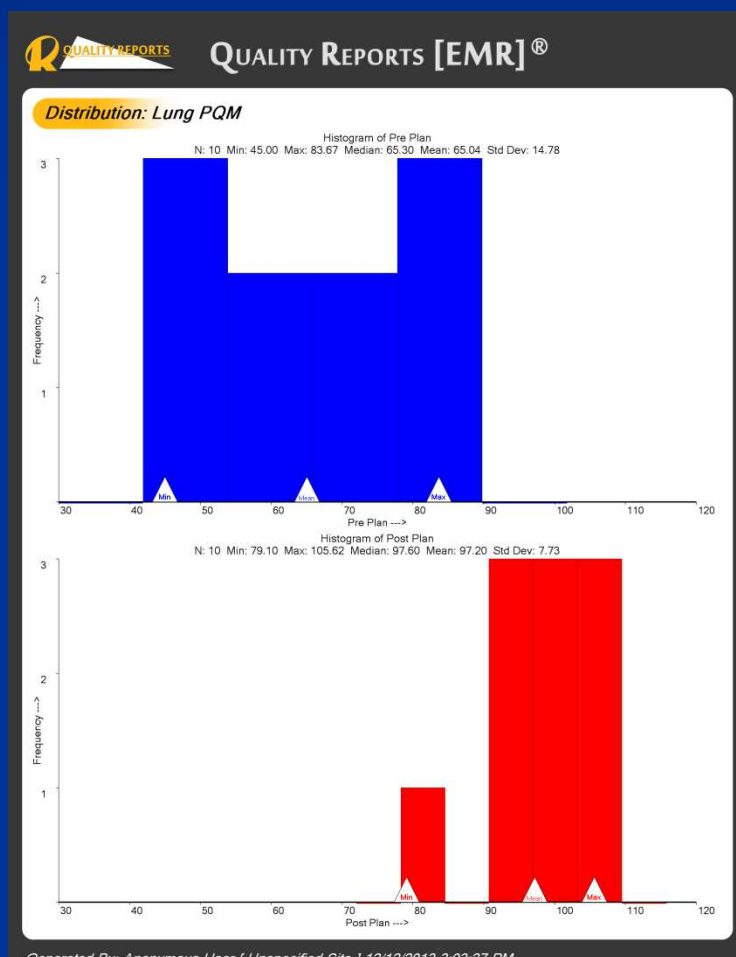
## Plan Quality Scoresheet: Lung 64.8

This is the Plan Quality results spreadsheet for Plan Quality Algorithm: Lung 64.8. The breakdown of results (metric-by-metric over all components) are shown in individual rows in the spreadsheet. SCORE: 100.17 (max 110.00)

Plan Quality Metric Component	Objective(s)	Result	Score	Max Score	Performance
[PTV1 64.8] V[64.8Gy] (%)	≥ 95 [ > 90]	96.3267	10.00	10.00	100.0%
[PTV1 64.8] D[0.03cc] (Gy)	≤ 71.3 [ < 71.32]	71.1689	10.00	10.00	100.0%
[PTV1 64.8] Volume of Regret [64.8Gy] (cc)	≤ 64.8 [ < 68]	58.6831	10.00	10.00	100.0%
[PTV1 64.8] Conformation Number [64.8Gy]	≥ 1 [ > 0.6]	0.8166	2.71	5.00	54.2%
[TOTAL LUNG] Mean dose (Gy)	≤ 16 [ < 20.1]	15.6700	10.00	10.00	100.0%
[TOTAL LUNG] V[20.0Gy] (%)	≤ 30 [ < 35]	28.7016	10.00	10.00	100.0%
[SC] V[50.0Gy] (cc)	≤ 0.03 [ < 0.31]	0.0000	10.00	10.00	100.0%
[HEART] V[30.0Gy] (%)	≤ 30 [ < 50]	12.8106	5.00	5.00	100.0%
[ESOPHAGUS] V[35.0Gy] (%)	≤ 40 [ < 55]	33.5726	5.00	5.00	100.0%
[ESOPHAGUS] Mean dose (Gy)	≤ 25 [ < 35]	26.2040	4.40	5.00	88.0%
Global Max Location (ROI)	PTV1 64.8 [PTV1 64.8; PTV2]	PTV1 64.8	5.00	5.00	100.0%
[PTV1 64.8] V[68.04Gy] (%)	≤ 5 [ < 25]	9.2989	15.70	20.00	78.5%
Global Max (Gy)	≤ 68.04 [ < 74.52]	71.4533	2.37	5.00	47.3%
<b>Total [13 Metrics]</b>			<b>100.17</b>	<b>110.00</b>	<b>91.1%</b>

# Study

Determine how well your measure compares to desired goal.  
Quantify Improvement in Quality of Planning

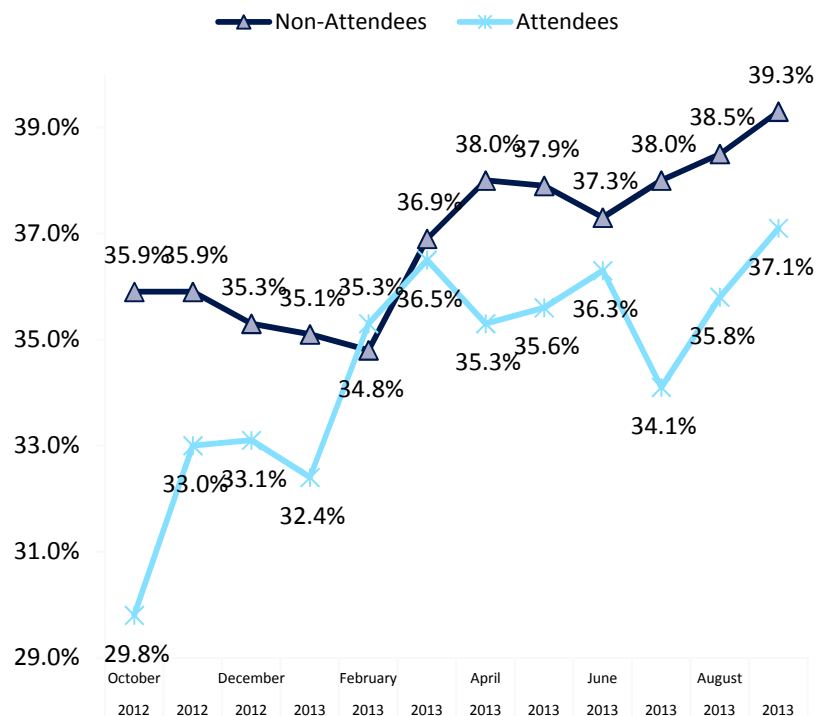


- Plans prior to training were evaluated using Quality Reports
- Plans replanned using techniques taught by Radiation Oncology Resources during 3-Day training session and IMRT Workshops
- Post plans re-evaluated
- Median score increased to 97.6 from 65.3
- Overall improvement: 66.9%- Well above stated goal of 10%

# Study

Determine how well your measure compares to desired goal.  
Quantify Improvement in Utilization

IMRT Utilization - All Diseases



- Data collected to compare use of IMRT prior to training to post training.
- All treatment areas showed marked increase in utilization across the USON Network.
- Network Utilization of IMRT went from 29.8% to 37.1%.
- Our practice's utilization of IMRT went from 17.1% to 28.3%. Well above stated goal of 10%.



# ACT

- Address root causes of failure to achieve desired goal
- Begin another cycle: Plan-Do-Study-Act and assess any gain achieved
- Use cycle continuously or intermittently to document stability of goals and/or the need to improve
- Evaluate all IMRT Treatment Plans using Quality Reports
  - Evaluate results and determine if plan can be improved upon
- Participate in EPIQ-Dosimetry Training Program
- Collect data to determine if using Quality Reports within a Radiation Oncology Department to evaluate all IMRT treatment plans will increase quality of plans.

# What are the four required steps to a Maintenance of Certification PQI Project?

- A. Plan, Do, Study, Act
- B. Question, Plan, Study, Act
- C. Plan, Study, Act, Follow-Up
- D. Collect, Plan, Study, Act
- E. Plan, Train, Act, Collect